The Artist's Chromatic Hand-Book.

13
1062.50
237.50

15.75
1062
513

1400
1062
338
4.20

THE

Artist's Chromatic Hand-Book.

BEING A

PRACTICAL TREATISE ON PIGMENTS:

THEIR PROPERTIES AND USES IN PAINTING.

TO WHICH IS ADDED,

A FEW REMARKS ON VEHICLES AND VARNISHES.

CHIEFLY A COMPILATION FROM THE BEST AUTHORITIES.

By John P. Ridner.

NEW YORK:
GEORGE P. PUTNAM, 155 BROADWAY.
1850.

STEREOTYPED BY
BILLIN & BROTHERS,
10 NORTH WILLIAM-STREET, N. Y.

E. O. JENKINS, PRINTER,
NASSAU-STREET.

TO THE MEMBERS

OF THE

New-York Art Reunion,

THIS LITTLE WORK

IS RESPECTFULLY DEDICATED

BY THEIR ASSOCIATE,

THE AUTHOR

Preface.

It has been said that one of the strongest evidences of the refinement of a nation, is to be found in the encouragement that the Fine Arts receive among its people. If it is so—and there is no reason to doubt it—this country must have made unprecedented advances in a due appreciation of the arts of design within the last few years; as the number of persons now interested in them, are as a thousand to one, compared with those who but a short period before gave the subject a thought. So generally has their influence extended itself throughout the country, that there is now scarcely a literary institution in the land, that does not make some department of them a branch of education, nor a town or village that cannot boast of giving employment to some professors of them. Indeed it is now generally conceded, that their cultivation is worthy the attention

of every class of the community; as they undoubtedly tend to refine the intellect, enlarge the powers, improve the morals, and generally enhance the happiness of mankind.

The increased demand for information pertaining to art, and the oft-repeated desires expressed by artists, to know more about the properties of the pigments used by them, together with the author's early predilections for experimental chemistry, and his fondness for the investigation of the composition, preparation, and uses of colours, adapted for painting, will in a great measure account for the appearance of the present work; and, humble as it is, if carefully read and its precepts observed, it is believed that it will aid somewhat in elevating the art of painting in this country.

Those acquainted with paintings, must have often witnessed the fatal effects of the want of such knowledge as is here inculcated, in the premature decay of many fine pictures, particularly those of the English school.

Several works of this kind, or bearing some resemblance to it, have been published in Europe; but most of them are deficient or incomplete. In some, valuable pigments have been entirely omitted; others, inculcate glaring errors, or are too expensive for ex-

tensive circulation;* and others are encumbered by useless verbage or technicality, rendering the knowledge they contain too difficult of acquisition for the tyro. All these have been carefully consulted; and, with the author's own experience, he feels confidence in assuring the artist, that this contains, in a condensed form, every thing of value pertaining to the subject on which it treats. The aim has been to make it concise and practical, in every respect, avoiding all unnecessary technicalities,

It is not the intention to give a detail of the various processes by which the numerous chemical colours can be produced, (that alone would occupy as much space as will be allotted for the whole work, and prove of very little profit to the artist,) as all of them can now be procured, of reputable manufacturers, of better quality, generally speaking, than they could be made by an inexperienced hand, yet the composition of nearly all will be indicated sufficiently (for those who are familiar with chemical science) to judge of their action on each

---

* One of the best works of this kind is Field's "Chromatography;" a work every artist ought to possess, who can afford the expense, as it contains many hints about the philosophy and harmony of colours that will be found interesting.

other, when exposed to the various influences to which they are subject in painting.

The author has produced and tested nearly every chemical colour here spoken of; yet he desires it to be understood that he has not depended solely on his own experience, but has availed himself of the investigations of the best authorities of Europe, particularly of Field, than whom there is none more reliable.

The mode of classifying the colours adopted by the distinguished writer just named, appearing to be the best and most natural, the same arrangement has been followed here; and wherever else the same author's labours could be made subservient to the object in view—the good of art and artists—I have not hesitated to press them into service.

At the present day there is such an abundance of pigments, and many of them such fine ones too, it is difficult to determine exactly, which to select or what to reject—and the more so, as some of them are much cheaper than they formerly were—but it will be the endeavour to give the true character and quality of each, and thus enable the artist to judge for himself what can be most judiciously employed for his purposes, and prevent disappointment in the result of his labours. It may be well here to remark, that too much care

cannot be taken in purchasing colours, to see that they *are* what they are *represented* to be, as frequent disappointments occur by want of proper attention in this respect, as colour-dealers sometimes (through ignorance or some less honourable motive) mislead artists; I have known cases where chrome yellow was sold for lemon yellow; cochineal, or other fugitive lakes, for madder lake; cadmium and lemon yellow, for platina yellow, &c., &c. I will point out tests by which such frauds can be detected, so that it will be the artist's own fault if he does not expose such ignorance or knavery hereafter. There is more necessity now for this knowledge than formerly, as artists of the present time are almost entirely dependent upon the colour-dealer, as they do not manufacture their own pigments as the ancients generally did.

The tables which are subjoined, will be found exceedingly convenient, to enable the student to ascertain at a glance the most useful and permanent pigments; but for a particular description of the qualities of each, reference must of course be made to their appropriate heads.

As it does not form a part of my plan, to impart any knowledge of the philosophy of relation, expression, or harmony of colours, those who are seeking

for information on those subjects, are referred to the works of Field, Hay, Goethe, and others.

Colours or pigments* being liable to various changes from the materials employed in fixing or distributing them upon the grounds to which they are applied, it is almost as necessary that the qualities and properties of these vehicles should be as well known as the pigments themselves; they will, therefore, claim attention, and form a part of my subject; to which will be added, a few remarks upon varnishes used by artists, and thus conclude my labours.

Hoping that this humble production may meet with the warmest welcome from American artists—the class for whom it is especially intended—it is respectfully commended to their kindest consideration, by their friend and servant,

THE AUTHOR.

NEW YORK, *October*, 1850.

---

* These two terms are frequently used synonymously throughout this work, as will probably be noticed, though it may not be considered strictly correct.

glass of borax (vitrified borax) with poppy or nut

THE

Artist's Chromatic Hand-Book.

White.

We shall begin our treatise with the Neutral—White. This when in its most perfect state is without hue with respect to colour, absolutely opaque, and reflecting light very brilliantly; these two last properties combined, is what is called *body*. Independent of its uses as a colour, (for in some respects it may be considered one,) it mixes with all others—of course diluting them; and while it does not change the class of any colour, it is itself changed by every other.

As pigments generally do not possess the brilliancy of pure white, it is necessary to break down or lower the tone of the latter, else it will degrade the former, and thus create harshness or rawness in a picture:

this quality in white has given rise to the common opinion that all pictures should be painted low-toned. Were all colours of the same purity and brilliancy, this feeling would not be experienced, and colouring in painting could be carried to the highest key of nature.

The term colour as applied to the neutrals, as before implied, is incorrect, yet the artist is forced to regard white as a colour, and philosophically it may be considered one, inasmuch as it is formed by the combination of all the colours.

White is more extensively used than any other pigment, and as it is the representative of light, it must of necessity enter largely into the composition of all colours, and in every picture: hence the importance of having good pigments of this kind must be evident to every artist. It is said that Titian was so well convinced of this, that he lamented, most pathetically, the death of the chemist who prepared his white.

It is supposed by some, that the old masters possessed whites which were superior to those employed by the artists of the present day; this, however, is doubted by others, who attribute the pureness, which

is observed in the local whites in some of the old pictures, to more careful preparation, a different mode of using them, or possibly to the addition of some cold colour to the white—such as plumbago, commonly called black-lead.

Pigments of this class are quite numerous, yet an unexceptionable one would be a great desideratum even at this age, when the science of chemistry has unfolded so many improvements in the preparation of others.

The white earths have very little body, generally; and the greater part of the metallic whites which have the best body, are not permanent in water, yet, with proper discrimination, many of the following will be found pretty well adapted for most purposes.

LEAD WHITES.

(Carbonates or Oxides of Lead.)

Under this head is comprehended a numerous family; known under the various names of Ceruse, London, Nottingham, Flake, Crems or Cremnitz, Roman, Venetian, Vienna, and Silver (Blanc d'Argent) Whites. The whitest and most compact are consid-

ered the best. In brilliancy and body, they have heretofore been considered* superior to all others, and, when pure, may be used with safety, (unless exposed to damp or impure air,) and dry well without any addition; but an excess of oil has a tendency to discolour them, forming a pellicle on the surface. In water they are ineligible, as they soon blacken: they also injure all vegetable lakes, (except those of madder,) red and orange leads, patent and king's yellow, massicot, gamboge, orpiment, &c.; but these, it will be borne in mind, are dangerous pigments, and should never be used by the artist.

Ultramarine, vermilion, chrome orange and yellows, madder colours, Indian red, sienna earth, and all the ochres, may be combined with these whites without injury. In oil painting, white lead forms an essential part in the ground, in dead colouring, in the formation of tints with all colours, and in scumbling—both alone and with other pigments. When neutralized with ultramarine, black, or plumbago, it forms the best local white; and may be considered a perfect representative of light when mixed with

* See remarks under head of Zinc White.

Naples yellow, orange vermilion, or cadmium yellow, in proper proportions according to circumstances.

All colours prepared from lead should be avoided in every description of painting in water colours, as well as in crayon or fresco; neither should they be used with any pigment having an inflammable base or liable to be destroyed by fire, for with such they occasion change of colour, either becoming darker, or inducing those with which they are mixed to fade.

Natural carbonate of lead exists in nature, but not in sufficient quantity to make it available to artists generally.

The properties of the whites before mentioned may be characterized as follows:—

LONDON AND NOTTINGHAM WHITES.

These do not differ materially from other English white leads: the latter is said to be prepared from flake white, and is therefore usually the greyest of the two. Inferior whites of lead are frequently made by the addition of sulphate or carbonate of barytes, whiting, or other earths, which impair their whiteness as well as their body, lessens their drying properties,

disposes them to keep their places less firmly, and to darken the vehicle with which they are mixed.

CREMS, OR CREMNITZ WHITE.

This is another carbonate of lead, which derives its name from Crems, in Austria, and is similar to that brought from Vienna, and known in commerce as *Vienna white.* It is made in cubical masses, and that which is the most compact, and breaks with a clean conchoidal fracture, is esteemed the best. Some prefer it to all other whites; but it has, in truth, no superiority over good flake white, though the quality varies according to the success or skill of the manufacturer.

FLAKE WHITE.

This is similar to the last, except in the form, from which the name is derived; the scales, or flakes, are usually slightly grey on the surface; it is fully equal to Cremnitz white, and having rather more body when well prepared, it merits a preference. It is sometimes ground to a very fine powder, and is then known as *body white.*

ROMAN WHITE.

This is a white, differing very little from the above, except that it is of a warmer flesh-colour on the external surface of the masses in which it is usually prepared; it is not, however, sold in this country, and, not being superior to those before mentioned, no special notice of it is necessary.

SILVER WHITE.

(Blanc d'Argent.)

The appellation of this pigment may be considered a false one, inasmuch as it is prepared from lead, and varying very little in composition from the other whites made from that metal. It is generally brought from Paris in the form of drops, and is more brilliant than the preceding; but this brilliancy it soon loses after being used, and is reduced to the level of other whites of lead, so that it does not deserve any preference over them, particularly as flake white has more body.

SULPHATE OF LEAD.

This is a very white precipitate, made by adding sulphuric acid to any solution of lead; it resembles the last-named white, when well washed and freed from acid, but is inferior to it in body, and is more susceptible of change when exposed to damp or impure air, either alone, or in tints.

The preceding comprehend all the best whites of lead; but there are other whites which are well worth attention, such as the following:—

ZINC WHITE.

(*Oxide of Zinc.*)

This is somewhat celebrated as a pigment, yet has not been very extensively used in this country. It is perfectly durable both in oil and water, but not generally possessing as much body and brightness as the whites of lead, it cannot be substituted for them in all cases;* nevertheless, it is a valuable pigment, par-

* By some late improvements in the manufacture of this white, it can now be produced so that it has all the purity,

ticularly in forming tints where not much body is requisite, as in glazing. By mixing it with factitious ultramarine, so close an imitation of ultramarine ashes can be made, that it forms a good substitute for it, and can scarcely be distinguished from the genuine article: in this way the late lamented Cole, the distinguished landscape painter, often used it—so he informed the author. When skilfully prepared as a body white for water colours, it is preferable to all others, as it has the property—and a desirable quality it is, too—of bearing out, when dry, of the same tone as when laid on, which is not the case with constant white. When it becomes better known, it will no doubt be more extensively used.

Carbonate of zinc is sometimes sold under the above name, and is far inferior to it as a pigment. This can easily be distinguished: the oxide will not

---

brightness, and body of the whites of lead. We cannot, therefore, doubt but that it will ere long take the place of the latter, over which it possesses the superior advantage of being perfectly permanent under all the various influences to which pigments are subject in painting, and the no less important quality of not injuring any other pigment by mixing therewith.

effervesce if thrown into sulphuric acid, as the carbonate will. In its drying qualities it is inferior to the whites of lead; but oil made desiccative by oxide of manganese, causes it to dry evenly throughout without skinning.

TIN WHITE.

(Oxide of Tin.)

This somewhat resembles zinc white, but has less body in oil than in water. It, however, works cloggy or pasty, and this is a great objection to its use; but it forms the basis of the best white for enamel painting.

BISMUTH WHITE.

(Oxide of Bismuth.)

This is of no value in painting, though a very beautiful white, on account of its great disposition to change, and is only mentioned to caution the artist against its use. It is also called *pearl white*, and under that name is sometimes sold as a cosmetic. *True* pearl white, however, was formerly made from the waste

of pearls and mother-of-pearls, and was anciently used in water colours; but other and better pigments have now taken its place.

CONSTANT WHITE.

(Sulphate of Barytes.)

This is generally known as permanent white, and has been extensively used in water, for which it is well adapted when perfectly free from acid, as in that it has a very superior body, while in oil or varnish it has very little. In the former it should be used with as little gum as possible; that appearing to destroy its body and whiteness. Gum ammoniac is said to work best with it. It possesses the property (when used in water colours) of drying several tones higher than when wet; this has been made an objection to its use by some artists. Its permanency is unquestionable.

The crude article is used in large quantities for adulterating the ordinary white lead of commerce, thereby injuring its body and reducing its value.

WHITE CHALK.

(Carbonate of Lime.)

This is an article well known to every one. When sawed into suitable form, or made into crayons with paste, it is used by the artist for tracing his designs, and for this purpose it should work smoothly and cut freely from grit. Paris white and whiting are prepared from it, and it is also the basis of many common pigments used in distemper, but to the artist is of no value.

Yellow.

Pigments of this class exist in great abundance in nature, and many more are produced by art. In their delicate hues, they approach nearly to white, and in a strong light can scarcely be distinguished from it; there is also a resemblance in the chemical relations between them.

Yellow being one of the primaries, it cannot be formed by the mixture of other colours, and its tenderness is easily defiled by every other.

CHROME YELLOW.

(Chromate of Lead.)

This pigment has now been in use many years, and is remarkable for its brilliancy, purity, and beauty of colour—very desirable qualities to the artist. Considerable prejudice has, however, existed against it; yet there is no good reason for rejecting its use, as, when well prepared and pure, (as a great deal in commerce is not,) it may as safely be used as the whites of lead, with which it cordially goes into tint without injury. It possesses great body, and works and dries well in oil; but is not well adapted for water, as it undergoes the same changes as other pigments, having the same base. It resists the action of light, or the sun's rays, for a long time; but exposed to damp, impure air, or sulphureted hydrogen, it loses its pure colour, and, by long exposure to such influences, it becomes a dark brown, like the whites of lead. These effects may, however, be averted wholly, or in a great

measure, by clothing the surface with a colourless varnish, such as that of white lac. It does not generally harmonize with the sober beauties of many other colours, nor with the modest hues of nature; it therefore usually requires toning down with other colours. Upon Prussian and Antwerp blues it produces rapid changes, ultimately destroying them, owing to the chemical action on each other; they should, therefore, never be used together in the composition of greens.

The late Mr. Cole—the distinguished landscape painter—it is well known, generally used this pigment for forming greens; and though many of his works have stood the test of a quarter of a century, none of them show any perceptible change in colour;* indeed, they appear in nearly every instance as perfect as when they left the easel, with the exception of the toning down which time always produces on all pictures: this is the best proof that can probably

---

* This may be owing to the fact that this artist always varnished his pictures with copal varnish as soon as they became perfectly dry, which served to protect them from change.

be adduced in favour of the permanency of this pigment when properly used.

A similar pigment is sometimes sold in France under the name of *jaune minéral.*

PATENT YELLOW.

(*Chloruret of Lead.*)

This is also known under the appellation of *Turner's yellow, or Montpellier yellow*, and is a ponderous, sparkling, crystalline substance; of a bright yellow, with as much body as chrome yellow, and working well in both oil and water; but being soon destroyed by sunlight and impure air, and injuring other colours, it should be shunned by the artist.

QUEEN'S YELLOW.

(*Sub-Sulphate of Mercury.*)

A pigment of a beautiful lemon colour, but so exceedingly changeable, by light, foul air, and in combination with other colours, it cannot be used with any safety, and should be discarded entirely from the lists of artists' colours.

NAPLES YELLOW.

(Oxides of Lead and Antimony.)

This appears to have derived its name from the place whence it was originally brought, being anciently known at Naples as *Giallolini*. It has long maintained a high reputation, but it varies considerably in tint, from a delicate light and warm to a golden yellow,* according to the quantity of oxide of antimony that it contains. It possesses great body, and should be used in oil or a varnish vehicle, in both of which it works and dries well. Under the effects of foul air and damp, it is affected like the whites of lead; but, unlike them, it undergoes serious changes when mixed with pigments having ferruginous bases—such as the Sienna earths, ochres, Antwerp and Prussian blues, &c.: indeed, iron in every form readily destroys its beautiful colour. Great care is necessary, in forming it into tints, not to use a steel palette-knife: for this purpose a horn or ivory one should be employed. It vitrifies by a strong heat without

---

* See note under head of cadmium yellow.

change, and therefore may be used in enamel painting; and here may be remarked, that vitrification does not improve the permanency of any colour, but it greatly increases the difficulty of grinding them. Another pigment under this name is also prepared by some colour manufacturers, in which the oxide of *zinc* is substituted for that of *lead;* this may be considered more permanent under the effects of foul air, damp, &c.

ANTIMONY YELLOW.

(Oxide of Antimony.)

This is very similar to the last in its uses and properties, though it has a little less body; in colour it is deeper and more of a golden yellow; not having any lead in its composition, it is not susceptible of change by sulphuretted hydrogen, damp, &c.

YELLOW OCHRE.

(Oxide of Iron and Earths.)

This well-known pigment exists in great quantity in every country, and is as extensively employed

in the useful as the fine arts, and may be considered the name of a class rather than a single pigment, varying some in constitution, and differing in colour from a pale to a deep yellow; all being much improved by separating the coarser particles and washing them. None of them can be considered as powerful colours, but they are nevertheless valuable, and are used in greater quantities than any other pigment except white; they may also be employed with perfect safety in every style of painting—in oil or water colours, distemper or fresco,—not undergoing any change in ordinary light, foul air, or damp: but it will be remembered that all the native ochres, Siennas, umbers, &c., have a tendency to lower in tone by time and exposure to light. Iron forming the basis of the colouring of the ochres, they are all reddened by burning, the paler ones producing the lightest reds.

The following are the principal ones, though they assimilate so much that it is difficult to distinguish all the different specimens from each other by a description of them.

OXFORD OCHRE.

This is brought from the neighbourhood of Oxford (Eng.): hence its name. It is slightly transparent, of a warm though not a bright colour, and in its natural state is generally in compact layers, of an argillaceous texture, cutting free and smooth—very much like old soap, and very absorbent. It works, like all the ochres, perfectly well in every mode of painting; its tinging powers are very great, and it may be considered one of the very best pigments of its class.

STONE OCHRE.

This is often sold for that last named, though differing considerably from it, inasmuch as it is generally in globular masses, found in certain kinds of rocks, free from grit, and *powdery* in texture; it also varies considerably in colour, some specimens being of a light yellow, while others are quite a dark brown. It possesses the general properties of the other ochres and can be used in the same way, and may be employed as dull red in enamel painting.

Other yellow ochres, in compact masses, are also sometimes known under this denomination.

PALE OCHRE.

As its name implies, this is a light ochre, differing but little from the foregoing, except in being of a lighter colour, and is eligible for the same purposes; when burnt, it produces the purest and most beautiful light reds, similar to the *terra rosa di Puzzoli*, so much admired by some for flesh painting.

ROMAN OCHRE.

A deep, rich, and powerful orange yellow, rather more transparent than the other ochres, and in other respects not differing from them. *Italian earth* is a similar pigment.

BROWN OCHRE.

Another variety of ochre, in no way differing from those previously named, except in being darker and more brown, which may be as safely and usefully employed as any of them.

SIENNA EARTH.

This pigment is more generally known as raw *terra di Sienna*, and is an ore or oxide of iron; in its natural state it is usually in small pieces, irregular in form, firm, and presenting a glossy appearance when broken, and very absorbent. It may be considered one of the most valuable pigments in use, and very few are employed more extensively; some specimens are nearly as pure as yellow lake, while others approach an orange; not being affected by the action of light or impure air, nor by many of the pigments in general use, it may be used with perfect freedom; it works equally well in every vehicle used for painting, and its transparency adapts it well for glazing. Burning converts it into an orange red, known as burnt Sienna, (which see.)

MARS YELLOW.

This is an artificial ochre; purer, richer, and more transparent than any of the natural ones. The pigments produced from iron exist in nature in very great abundance, and in an almost endless variety

of colour, from a light yellow to orange, scarlet, red, brown, and purple, which may be imitated by art—such are the Mars colours; they are of comparatively modern introduction, yet have been long enough in use to test them fully, and to prove that they are a most valuable addition to the palette; being of the nature of the ochres and Sienna earths, they may be used in every mode of painting where those colours could be employed. All of them are sufficiently transparent for glazing, and dry well.

YELLOW ORPIMENT.

(Sulphuret of Arsenic.)

A bright, beautiful, and pure yellow, formerly much used both in water and oil; but its want of permanency, and its injurious effects on other pigments, have induced most artists very wisely to discard it entirely from their palettes. It may, however, be safely employed with some pigments, but so few, that it would be better to substitute some other for it that does not require so much caution in its use—such as the cadmium yellow. It dries badly; and if used with drying oil made with oxide of lead, or

formed into tints with white lead, its colour is destroyed thereby: indeed, all colours having lead in their composition are injured by it, and it has so much affinity for oxygen as to destroy nearly every pigment which depends upon that element for its colour.

KING'S YELLOW.

This is but another name for the above.

CHINESE YELLOW.

A pigment brought from China, very nearly similar to the last two in composition, and equally objectionable in its use.

ARSENIC YELLOW.

(Oxides of Lead and Arsenic.)

This is also called mineral yellow; in colour it is very much like orpiment, but it dries better, and is not affected by pigments having lead bases, nor is it so much disposed to change in tint with white lead: nevertheless it is objectionable, as all pigments are which have arsenic in their composition.

CADMIUM YELLOW.

(Sulphuret of Cadmium.)

This may be considered one of the most valuable pigments which chemical science has brought to light. It varies in colour, from a pure golden to an orange yellow, possessing a good body, and passing readily into tints with white lead;* enduring light and remaining unchanged in damp or impure air, and working well both in oil or water, but in the latter should be well clothed with gum. In brilliancy it is not equal to chrome yellow, but its tones possess all the sober and quiet beauty of nature. The metal from which it is made is a scarce one, and worth about double as much as silver; the pigment cannot, therefore, be afforded at a very low price, nor can it be procured in large quantities; yet its utility is so great, and now so well understood by most artists,

---

* A great portion of the Naples yellow now sold is a combination or mixture of cadmium yellow and white lead, and it is really preferable to that composed of the oxide of lead and antimony, as it is not subject to change by the oxides of iron in the ochres or other ferruginous pigments.

that very few, particularly landscape painters, are willing to deprive themselves of it.

Its high price has induced the cupidity of dealers sometimes to adulterate it, or to sell inferior pigments for it. These frauds can be detected by the following methods: Orpiment, which is sometimes sold for it, will be known by its being soluble in water of ammonia, and by subliming at a dull red heat; while the genuine is unchanged by both the former and latter tests. A solution of caustic potash has no effect upon this pigment; while with chrome yellow (which bears some resemblance to it) it takes up a portion of the chromic acid, forming a yellow solution of chromate of potash, and changing the colour to a brownish orange: by these features the two can readily be distinguished.

PLATINA YELLOW

Is a pigment prepared from platina, of a deep yellow, very similar to Sienna earth in colour, but rather warmer, richer in tone and more transparent, and permanent both in oil and water. The author has seen but one specimen that appeared to be genuine. When it is called for in the stores of the colour-

men, in this country, cadmium yellow is generally sold for it, and thus the artists are misled and confuse one with the other, although there is a great difference between them, as may be easily discovered by the description of each. Platina sells for about three times the price of cadmium, and therefore the pigment made from the former metal could not be afforded at the same rate as that made from the latter. This is stated as a matter of fact, and not to give the impression that one is better than the other, for it is extremely problematical which of the two is the best; but that from cadmium has been well tested by experience, and deserves all that has been said in its favour. The same good character may be due that of platina, but it has not been so fully proved.

LEMON YELLOW

Is a brilliant, delicate, light yellow, nearly equal in body to Naples yellow, but more pure and tender, both alone or in tint; and is one of the most unobjectionable and valuable pigments in use, as it is not liable to change by damp, sulphuretted hydrogen, or impure air, nor by the contrary influences of light or

oxygen, the steel palette-knife, nor by mixture with any other colours, either in oil or water, in both of which it works admirably. It is especially adapted for landscape painting, forming cool and tender greens, heightening the lights without producing *chalkiness*, which the whites are apt to do. Not being affected by lime or alkalies, it may also be used in fresco painting with perfect safety.

This pigment is known to some of the English colourmen by the name of platina yellow. It is, however, very different from that, (as will readily be understood by the description,) and should not be confused with it.

Pale chrome yellow is also sometimes sold for it, but this fraud can be easily detected by pouring some solution of caustic potash on it, which will produce scarcely any change of colour in the genuine, while upon the other the effect will be as stated under the head of cadmium yellow, (which see.)

STRONTIAN YELLOW.

Another pigment answering very nearly to the same description as the above, except that it does

not possess as much body, and may therefore be employed as a glazing colour. In water colours it may be substituted for the fugitive gamboge. Its purity may be tested in the same way as the preceding pigment.

MADDER YELLOW.

This is a lake prepared from the madder root, which in colour and brightness fully equals Indian yellow, but is more transparent, and of greater power. Like all madder colours, it works well in all kinds of vehicle; but terrene, metallic, or alkaline pigments act upon and redden it slightly, producing what is technically called foxiness; and even when alone, time has somewhat the same effect upon it, so that, upon the whole, it is the least eligible of all the madder colours, as it cannot be considered perfectly permanent in its hue in the respect alluded to.

GAMBOGE.

This is a well-known gum, brought from the East Indies, and the produce, it is said, of several kinds of trees. It has long been employed as a water

colour, and its facility of working has been a great temptation for its use; but it is too fugitive to merit a place on the palette of the artist. It cannot be used in oil, except with considerable difficulty, or unless formed into a paste with water, with some lemon yellow added to it; but this is an expedient that there is no need of resorting to, as there are other pigments which can well supply its place.

EXTRACT OF GAMBOGE.

This is the colouring matter of gamboge, extracted by precipitation from an alcoholic solution, thus being separated from its gum. It is readily miscible with oil, and sufficiently transparent to be used in glazing. In colour it is improved, being deprived of its greenish tone. In other respects, it possesses no advantages over the natural production.

GALL STONE.

This is a stone or calculus, which is found in the gall-bladder of various kinds of animals, principally oxen; varying a little in colour, but generally being

of a golden yellow, is very powerful, and has long been highly valued as a water colour. Although it is unchanged by damp or impure air, it is, nevertheless, soon destroyed by light.

It is not eligible in oil painting, and in water colours, Mars yellow had better be substituted for it.

INDIAN YELLOW.

This pigment is brought from India, and is produced from the urine of the camel and some other animals. It is imported in fetid balls, which appear to be phosphate of lime united with some colouring matter, not fully examined. To fit it for the use of the artist, it is necessary to purify it by washing, &c.; it is then of a beautiful and pure yellow, light and powdery; it has considerable body, yet is sufficiently transparent for glazing. In water colours it works well, and resists the sun's rays perfectly; but in ordinary light or atmosphere it is not quite permanent, though not affected by damp or impure air. In oil it is most objectionable: owing to its alkaline properties, it has an injurious action on the whites and other pigments having lead bases, as well as

on carmine and the lakes of cochineal; it may, however, be used with safety in fresco painting.

YELLOW LAKE.

Under this denomination is comprehended quite a number of pigments, varying from a bright yellow to a brown, which are formed by precipitating the colouring matter of vegetables on a base of alumina or oxide of tin, or, for the more common purposes, whiting is sometimes employed. The finer kinds are usually in drops; they are about as transparent as other lakes, and like them work pleasantly both in oil and water, but in the former dry badly. They are rapidly changed by the action of the whites of lead and other metallic pigments, and their colours being soon destroyed by light and pure air, they cannot be considered as eligible for the uses of artists, though the beauty of some of them has been a great temptation for their employment.

QUERCITRON LAKE.

This is a lake prepared from the well-known quercitron bark, so extensively used in dying, and is one of the best yellow lakes just mentioned, but cannot be relied upon as perfectly permanent; though if used with varnish alone, it may stand well for a considerable time. It must, however, be remembered, that oil rendered desiccative by lead, or the whites prepared from the same metal, change its pure colour to a brown.

WELD LAKE.

This is a yellow lake made from a favourite dying plant, (*reseda luteola*,) which in permanency and general properties does not differ much from the last named, and is not inferior to it, though of a more greenish hue.

ITALIAN PINK.

An absurd name for another brownish yellow lake; the better kinds possess considerable beauty

and depth of colour: but they are all fugitive, and do not deserve a place on the palette of any artist who desires his works to remain as they leave his easel.

English pink is the name of a pigment of the same character, deserving no special remark.

Red.

Red is the second and intermediate of the primary colours, standing between *yellow* and *blue*, and also bears the same relation to white and black or light and shade. It is the most pre-eminent as well as the most positive of all colours: forming with yellow, the secondary *orange* and its near relatives, scarlet, &c.; and with blue, the secondary *purple* and its allies, crimson, &c.

It forms the principal colour in the tertiary *russet*, entering also into the composition of the two other tertiaries, *citrine* and *olive*, as well as in various shades of the semi-neutrals and their relatives.

Red being a primary—consequently a simple

colour—cannot be made by the mixture of other colours; and is so useful in art, that good pigments of this class may be considered of all others the most indispensable; fortunately there are a great many of this denomination, and those here enumerated will be found the most desirable.

VERMILION.

(Sulphuret of Mercury.)

This is one of the oldest pigments in use, and was known to the ancients under the name of *minium*, a term which is now only applied to red lead, (*per-oxide of lead.*) It is found native, and is also produced in large quantities by art; in the former state it is known as *cinnabar*, and is in fact an ore of quicksilver. It varies in tint from a scarlet to a deep red, the former is generally esteemed the best; the kind which is brought from China, and known in commerce as Chinese vermilion, is of a more crimson tone than any other; both sorts possess great body, and work admirably both in water and oil, and may be relied upon as perfectly permanent, either alone, in tints, or mixed with other colours.

Vermilion has suffered some in reputation by bad association. Some contend that it fades by exposure to light, while others maintain that under other influences it blackens; these opinions have no doubt been formed from trials on adulterated or badly prepared specimens. As it has been so well tested by time, no fears need be entertained, that it will not sustain the character given it above.

It is frequently adulterated by red or orange lead. This is easily detected by throwing a small quantity on a shovel or a spoon heated to a dull red, which will entirely evaporate the vermilion and leave the adulteration; the same admixture could also be determined by muriatic acid, which would turn the lead to a white or grey, while if pure it would not be changed. Iodine scarlet (*biniodide of mercury*) and common lake are said to be used sometimes to improve the colour, but both of these being very fugitive they only add temporary beauty to it, and defeat the object intended to be attained; no pecuniary benefit, however, would be derived from these two adulterations, as both of the pigments alluded to are more expensive than the best vermilion.

IODINE SCARLET.

(*Biniodide of Mercury.*)

This is the pigment known in some of the catalogues of English colourmen, as *pure scarlet;* and is the most vivid and beautiful scarlet known, far exceeding the brilliancy of vermilion, and not inferior to it in body. It is nevertheless unfit for the use of the artist, as it is so susceptible of change that it cannot be used with any safety; a moderate heat, even a strong sunlight, will dissipate it; impure air will decompose it and reduce its base to the metallic state; the steel palette-knife will also change its colour.

It is sometimes used for the brilliant high lights in sunsets, and for giving the gorgeous effects of fire-light, lightning, &c., in coloured prints; when employed alone in this way, clothed with a vehicle formed by a solution of gum ammoniac in water, it appears to stand very well.

RED LEAD.

(Peroxide of Lead.)

This has been generally discarded from the lists of artists' colours, as scarcely worthy of being mentioned among them; though it still retains a place in some of the old style water-colour boxes, and is probably used by some whose works do not always deserve to be handed down to posterity as specimens of high art.

It was formerly known by the name of minium, (sometimes confounded with vermilion, which it somewhat resembles, though rather warmer,) and is now principally used for rendering oils desiccative. When employed alone and in raw oil or varnish, it stands pretty well when exposed to light; but it changes rapidly in tints with the lead whites and several other pigments, as well as by sulphuretted hydrogen or impure air, which blackens and metallizes it.

RED OCHRE.

This may be regarded as the name of a class, rather than any one pigment; comprehending *Indian*

red, Venetian red, light red, Indian ochre, brown red, Armenian bole, &c. Each will be treated separately, or at least such of them as are thought the most important; among which may be enumerated the following:—

INDIAN RED.

The true Indian red was brought originally from Bengal—hence its name, and is in fact a species of iron ore. It is usually associated with silicious matter, from which it is separated and washed before it is fit for use. It varies considerably in colour, but that which is the most lakey or rosy in tone is valued the most. It works equally well in oil or water, and like the ochres, it is not affected by light, impure air, time, nor by any other pigment; it may, therefore, be considered entirely unobjectionable in its permanency. An inferior pigment is often sold for it, which has injured the reputation of the genuine; but, with a little care and experience, one can be easily distinguished from the other. It must be borne in mind, that it is generally sold numbered one and two; the former being the brightest, and the latter the most purple.

It possesses too much opacity to be used as a glazing colour, but forms some beautiful tints for flesh.

VENETIAN RED.

The pigment bearing this title, is usually made by artificial means from the residuum of preparations of iron in chemical manufactures; though a natural ochre was formerly known to the Venetians, and hence the name. That in general use, possesses considerable body, vast tinging power, and the general properties of the ochres.

Spanish red is a native ochre very similar in its qualities to the above.

LIGHT RED.

This is produced usually by submitting yellow ochre to a dull red heat, the lighter and brighter specimens forming the most delicate colours. There is, however, a natural ochre closely resembling it, and this has some tendency to darken by time; in every other respect, light red possesses the properties common to all ochres, working well in every kind

of vehicle and mixing with almost every other pigment without undergoing change, and useful in every department of painting.

BROWN RED

Is a native ochre, intermediate in colour between Indian red and light red, which can be imitated by burning brown ochre, Italian earth, &c., and may be used for the shadows of lighter reds; in its general properties, it is similar to the other ochrous pigments.

MARS RED.

An artificial ochre, more pure and delicate in its tints than the natural ochres, and working equally well in oleaginous or watery vehicles; being semi-transparent, it is well adapted for glazing; on that account it will be preferred to any of the ferruginous reds, already named, for the carnations of flesh, or landscape painting. Its constitution being similar to the ochres, in permanency it may be considered undoubted.

LAKE.

This is a generic term for an extensive class of pigments of various colours, made by precipitating the colouring matter from tinctures of dying materials on alumina, metallic oxides, or earths; cochineal, seed-lac, and Brazil-wood, furnishing the greater part of the crimson and scarlet lakes, but all these are more or less fugitive. The only perfectly permanent ones are those of madder.*

Among those which may be especially mentioned are the following:—

ROSE MADDER LAKE.

The discovery of the method of producing this beautiful colour, supplied a desideratum which was wholly unknown to the ancients, who possessed nothing approaching it in permanency; a pigment

---

* It should be observed that all the lakes, when ground in oil, soon become "*livery*," as it is called, and unfit for use; it is, therefore, better to keep these pigments in the dry state, to be ground or rubbed upon the palette, as occasion may require.

that is now considered indispensable in every mode of painting, and on every palette, affording the only true rose colour, possessing the mellowness and purity of nature, with perfect transparency. It works well in oil or water, but in the former vehicle, like all the other lakes, it requires to be used with a strong dryer. With lead white alone, or in combination with other colours, it bears unchanged the various effects of the gases, light, or impure air. As a water colour, it does not work with the fulness or facility of some of the fugitive lakes, yet its permanency, under every circumstance, cannot fail to give it the preference over every other. Sometimes it may be found too brilliant, but this objection may be easily obviated by toning it down with manganese brown or umber.

It may be made of various depths of colour, from the deepest crimson to a light rose, all being equally good, and differing only in the quantity of colouring matter that they contain.

The madder lakes are frequently adulterated with the fugitive lakes of cochineal. These deceptions are easily detected by water of ammonia, or hartshorn, as it is usually called. This will dissolve the colour

of the latter, while upon the former it will have no effect. By dissolving carmine in this way—in ammonia, the beautiful carminated red ink (generally imported from France) is made. If adulterated with the lakes from woods, the colour will be changed to a purple by the same test.

SCARLET LAKE

Is a very beautiful transparent red lake, made from cochineal, of considerable power. It works well in oil and water, but in the former dries very slowly, unless some siccative be added to it. The sun, or even ordinary light, soon destroys its colour. Employed in tints with white lead, or mixed with other pigments, it is equally fugitive. If, however, it be used pure, and in considerable body with a resinous vehicle, it may last for years, but it would be best never to employ it when perfect durability is desired. Vermilion has an injurious effect upon it, therefore its use as a glazing colour over that pigment is unwise.

FLORENTINE LAKE

Is very similar to the last, except that in colour it tends to a crimson.

MUNICH LAKE.

A more deep and powerful colour than the preceding one, and inclining still more to a crimson; in other respects, not essentially differing from it. Another lake of the same character, is known under the name of *Hamburgh lake.*

CARMINATED LAKE.

Another of the numerous family of cochineal lakes, in depth and power excelled by none of them, and in its general properties the same as those already noticed. The specimens vary in colour from a scarlet to a crimson.

INDIAN LAKE.

This is a purplish red lake, made from *lacca*, or *seed-lac*, of India, the production of an insect. It is equally transparent and deep, though not as brilliant, as the lakes of cochineal, but rather more durable. In its properties of working and drying it resembles other lakes.

This lake has probably been in use longer than any other, and is supposed to have been employed by the masters of the Venetian school in their best works.

CARMINE.

This term is generally applied to the brilliant reds produced from tinctures of cochineal, and is the first feculent deposite of the colouring matter; the secondary precipitate, with alumina, &c., forming the lakes already described. It is exceedingly transparent, powerful, and rich, varying in colour from pure red to crimson, and requiring much skill in its preparation. It works pleasantly in water and oil, but its lack of permanency, in ordinary light, either alone or with other colours, and

in tints with white lead, like the cochineal lakes, unfits it for the use of artists. Large quantities of it are, however, used in colouring cheap prints, being well adapted for this purpose on account of the facility of its use, by reason of being soluble in water of ammonia: a quality, it will be remembered, which distinguishes it from the colours of madder.

MADDER CARMINE.

As the name implies, this is prepared from madder, and is the deepest and richest deposite of the colour, differing only in this respect from the madder lakes, and is the only perfectly durable and unobjectionable carmine yet produced, working with great facility in every mode of painting. It is not in itself, however, so rich and brilliant as that from cochineal; but, with proper management, it can be made quite as effective, beautiful, and true to the colours of nature.

ROUGE.

This is a preparation from safflower, the same as is known in France as *rouge végétale*, which is

employed in making *pink* saucers. Being an exceedingly fugitive colour, it does not deserve any attention from the artist.

Blue.

Blue is the third and last of the primaries or simple colours, bearing the same relation to shade that yellow does to light. It enters into combination with yellow in the composition of all *greens*, and with red in all *purples*, and is a subordinate of all the tertiary colours.

The number of blue pigments, compared with yellow and red, is limited; but in their perfection, they are fully equal to them. The following include all the best of them, and quite enough to answer every purpose of the painter:—

ULTRAMARINE.

This celebrated pigment is supposed to be the same as that formerly known as *Armenian blue*, and

is prepared from an oriental precious stone called lapis lazuli. It has been highly prized from time immemorial for its singular beauty and permanency, and hence a great many experiments have been made and much time expended in attempts at imitating it, resulting in the production of a factitious article possessing a great deal of the beauty and nearly the permanency and purity of colour of that from the natural stone.

The reputation of the true ultramarine has not been based upon any questionable pretensions, as it has been tested by time and every other trial to which the best pigments have been submitted, and has not been found wanting in permanency, being neither subject to change by damp, impure air, shade, nor the intensest light, so that in the oldest paintings, in which it has been used, not the least change is apparent. In colour it varies from the most extreme depth of shadow to the highest point and brilliancy of light, and transparent in all its degrees, as well as pure in its tints.

In oil it works agreeably and dries well, but its grittiness renders it a little unpleasant in a water vehicle. It is eminently adapted for skies, yet it

may be nearly as useful in painting the delicate silvery greys of flesh, or the exquisite colours of flowers, by reason of its entering so admirably into purples, blacks, greens, greys, and broken colours. It has obtained the reputation of clearing or carrying light and atmosphere into all colours with which it is mixed, and thus acquiring a claim for universality of use that no other pigment is entitled to; these remarks apply to the most perfect specimens of ultramarine. It should, however, be remarked, that there is considerable difference in the specimens, according to the skill used in preparing it, some being coarse in texture, and of a purple or greenish cast, owing to a portion of red or yellow oxide of iron which is often associated with the lapis lazuli, while others assume a dusky hue from the sulphuret of lead which is combined with it in some cases; all these are equally useful in their proper places. Its high price (being sometimes sold as high as $30 or $40 an ounce) has often induced dealers to adulterate it, sell inferior pigments for it, or dye, dampen, or oil it, to enrich its appearance; but the genuine may be easily distinguished from the imitation, by dropping a small quantity in some

lemon-juice, or almost any other acid, which will immediately destroy the colour of the true ultramarine, leaving an ash-coloured precipitate, while the factitious retains its colour, or loses it *with considerable effervescence*, as noted under the following head.

FRENCH ULTRAMARINE.

The best factitious ultramarine is known under this name; that manufactured by Guimet, for which the French government granted him a premium of six thousand francs for the discovery of the method of preparing, has long maintained its pre-eminence, and approaches nearer the purity and beauty of that made from the lapis lazuli than any other. It is a deep and rich blue, but is darker and less azure than true ultramarine of the same depth, and though t y cannot be considered perfectly permanent, yet under ordinary circumstances it is sufficiently so to entitle it to substitution for the genuine, in the composition of which it bears so close a resemblance, that it answers to nearly the same tests; acids usually produce effervescence and

a brownish precipitate, and fire generally darkens but does not destroy its colour.

Although so extensively employed in oil, in which it dries well, considerable objection is often made to its working badly in tints with white lead, from its tendency to separate from it, the white rising to the surface; but as no other, except the true pigment, has yet been discovered to equal it in colour, this complaint has not superseded its use. As a water colour it works and washes well, and is as permanent as in oil.

PERMANENT BLUE.

Within the last few years, a beautiful blue pigment under this name has been added to the lists of artists' colours; it is a deep blue tending to purple, less azure and not as powerful as the last named, but not differing materially in other respects from it. It is known in commerce as *German ultramarine*, and is extensively used in the industrial arts.

COBALT BLUE.

The finest blue known by this appellation is produced by a precipitate of the oxide of cobalt upon alumina, brought up by a strong heat, and is known as *Thenard's blue.* It differs a little in purity; when well prepared is a very beautiful and pure blue, tending neither to green nor purple, and nearly equal in brilliancy to the best ultramarine. It has not, however, quite as much transparency and depth, nor the modest hue of the latter, though superior to all other blues in colour. In a water vehicle, it is preferred by many to ultramarine, on account of its facility of working. In oil, it also works agreeably and dries very well. It undergoes little or no change in strong light, neither does it suffer by mixture with other pigments, but impure or damp air greens and ultimately blackens it. With a suitable flux it may be employed in enamel painting.

Other pigments prepared with an oxide of cobalt upon a silicious base, are sometimes sold as cobalt blues, but these are far inferior to the above; some of them will be comprehended under the following heads:—

ROYAL SMALTS.

This is one of the vitreous cobalt blues just alluded to, and is similar to *Dumont's blue, royal blue*, and *powder blue*. These are all light blues, without much body, and being of a gritty texture they do not work very pleasantly; an objection which applies to nearly all vitrified pigments. The finer kinds, however, when well ground, are pretty well adapted for water colours, and they also dry well in oil; but, upon the whole, cobalt blue is of greater utility and permanency.

It has long been employed as an enamel colour, and used in that way it is perfectly permanent.

PRUSSIAN BLUE.

(Ferro Cyanide of Iron.)

This is a well-known deep blue colour of great power, and quite transparent, which forms tints of considerable beauty with the lead whites, though not equal to those of ultramarine or cobalt blue, neither are they permanent, as they soon assume a greenish tone and fade in a strong light. In damp

or impure air, it changes to a purplish hue and ultimately blackens.

It dries well in oil, and its transparency adapts it for glazing, but its greatest utility is in painting deep blues, as its depth and transparency gives it force; in forming purples with lake, and in adding intensity to black, it may be employed to advantage.

It is extensively employed by some artists with chrome yellow in the composition of greens, (forming what is termed chrome or Brunswick green;) but its use in this way cannot be too strongly reprobated, as the colour soon changes, and is finally destroyed—even with the ochres it is not entirely permanent. Its most useful applications, therefore, are for common painting and the laundress. *Berlin blue* is another name for the same pigment.

ANTWERP BLUE.

The composition of this pigment differs from the last only in having a portion of alumina united with it, and being of a lighter colour; in other respects, there is no material difference, and no greater permanency can be claimed for it.

INDIGO.

This is a well-known pigment, produced from a plant which is found in various countries; it varies considerably in quality and is principally used in dying.

It works very well as a water colour, and is a good substitute for Prussian blue, being a sober and clear blue; forming with Indian red, fine purple shadows, and with Sienna or the ochres, agreeable and quiet greens. In oil it is of very little value, as in tints with white lead it is very fugitive, and siccative oils and various pigments injure it.

INTENSE BLUE.

This is a precipitate of the colouring matter of indigo, from a solution in sulphuric acid, which renders it more powerful, deep, and transparent, equal in colour to Antwerp blue and more durable in water, in which it washes and works well; but in oil, like indigo, it is quite changeable, and should be avoided.

BLUE VERDITER.

This is made by precipitating nitrate of copper by lime. It is quite a beautiful light blue, and like all the other pigments prepared from copper, is very susceptible of change—damp, impure air, and even time will turn it greenish and ultimately blacken it; but used alone, and exposed to light, it will last a considerable time. It is by no means an eligible pigment for the use of artists; a further description of it therefore is unnecessary.

SAUNDERS' BLUE.

The name of this pigment is supposed to be derived from *bleu de cendres*, a corruption of *ultramarine ashes*. There appears to have been two kinds of it, the one a natural and the other an artificial production; the former is similar to the following, and the latter not unlike the verditer above mentioned.

MOUNTAIN BLUE

Is a beautiful blue mineral, found native in copper mines, and is a carbonate of copper. In its character

it is like the two blues last mentioned, and not deserving the attention of the artist.

SCHWEINFURT BLUE.

Another of the family of copper blues, just as objectionable as any of them, and only named to caution the student against its use in fine art.

BLUE OCHRE.

(Proto-Phosphate of Iron.)

This is found native in small quantities, but is generally produced by art; the former is the most powerful in colour and possesses the greatest body. It is to blue what Oxford ochre is to yellow; consequently is more admirable for its modesty than brilliancy. Its general character is very similar to the ochres; the artificial (the only kind usually to be obtained) is more transparent. It works well in every mode of painting, dries readily in oil, suffers no change by white lead or other pigments, nor by exposure to strong light, damp or impure air; it may therefore be considered a very unobjectionable pig-

ment. In appearance it is very much like the lower grades of ultramarine, is adapted for somewhat similar purposes, and answers to the same acid tests; from which, however, it can be distinguished by exposing it to a red heat, which changes it to an ochrous brown oxide of iron.

Orange.

This is the first of the secondary colours in its relation to light, being composed of *yellow* and *red*. When inclining to red it takes the name of *scarlet*, and when towards yellow it is termed *golden*. With green it forms the tertiary *citrine*, and with purple, *russet*.

The following will be found to comprehend all the pigments of this denomination worthy of mentioning, and includes some which are generally known as reds and yellows.

MIXED ORANGE.

This being composed of red and yellow, its place may be supplied by mixture of the two primitives, by glazing one over the other, or by other modes of working; generally speaking, however, mixed pigments are inferior to the simple.

ORANGE VERMILION

(Bi-Sulphuret of Mercury.)

In appearance this resembles red lead, but is not subject to any of the changes of that pigment, being perfectly durable in oil or water colours. It is a powerful tinger of white, yielding pure and delicate warm tints, and drying well in simple linseed oil, possessing all the good properties as well as the body of other vermilions, and can be tested in the same way.

In the process of washing the ordinary vermilions a certain portion is suspended in the water for some time without settling, and this, decanted into another vessel, forms the orange vermilion.

CHROME ORANGE

(Di-Chromate of Lead)

Is a brilliant and beautiful orange pigment, and one of the most permanent and unexceptionable of the chromates of lead.

When skilfully prepared it is brighter in colour than orange vermilion, but not superior to it in durability or body, and is subject to the same changes as chrome yellow, though in a somewhat less degree.

ORANGE OCHRE.

Many of the natural ochres are of an orange colour, while others are produced by burning the yellow ochres, thus acquiring greater depth and transparency. In colour they are not very bright, but form good flesh tints with the whites of lead. Like the other ochres they are perfectly permanent in every mode of painting, and dry well in oil.

MARS ORANGE.

This is an artificial ochre, very similar in its colour to the above, but much brighter, richer, more lucid,

and better adapted for glazing; its properties in other respects are very much like the natural ochres, except that it is rather more chemically active, and, therefore, greater caution should be exercised in mixing it with pigments which are affected by iron.

BURNT SIENNA EARTH.

As the name implies, this is produced by burning *terra di Sienna*, forming an orange russet pigment extensively used in every mode of painting; heat increases its depth, improves its transparency, and makes it work more freely than in the *raw* state, in other respects it retains the properties of the natural colour, and may be safely employed with nearly every good pigment, whether in oil or water.

ORANGE ORPIMENT.

(Sulphuret of Arsenic.)

This is what is usually termed *red orpiment*, in contradistinction to *yellow orpiment*. It is a brilliant orange, resembling—in appearance—deep cadmium yellow, but can be easily distinguished from the latter,

by its being soluble in ammonia. What was said of yellow orpiment, as it respects its permanency, may with equal truth be said of this.

ORANGE MADDER LAKE.

This madder lake does not differ in its general qualities from those already described, except in colour, and a slight tendency to redden by time; it is, however, a very eligible pigment, and can be made to vary in tint from a true orange to an orange russet.

Green.

This occupies the middle station in the natural scale of colours relatively to light and shade, and is the second of the secondary colours: being composed of the primaries, yellow and blue.

This is considered the most effective, distinct, and striking, of all compound colours: mixed with orange it forms the one extreme tertiary, *citrine;* and

with purple, it produces the other extreme tertiary, *olive*.

MIXED GREENS.

These being composed of blue and yellow pigments may be employed to supply the place of simple greens, in various modes of working—mixing, glazing, or by blending them in other ways, and in such proportions as to suit the various hues required. In compounding colours, however, it should be borne in mind, that it is all important that they agree chemically, and be nearly of the same degree of durability, else their hue may change, and the beauty of the work on which they are employed be lost; on this account, it would be well, as we have before intimated, to use simple colours, when they can be found to answer the same purpose. *See chrome green, cobalt green, and Prussian green.*

TERRA VERT.

There are several varieties of this native ochrous pigment, some of them being of a bluish green,

while others incline to a yellowish green; the former are preferred. They partake of the general character of the ochres, but are rather more transparent; although not bright, are very useful pigments, and are very durable, not being affected by strong light or impure air, and combining with other colours without injury. They are rather the best adapted for oil, in which they dry well.

There are also some green earths which derive their colouring matter from copper; these are not true terra verts, and should be avoided: although brighter than those first named, they are inferior in every other quality.

The pigment known as *Verona green,* is very similar to the true terra vert.

CHROME GREEN.

(Oxide of Chromium.)

The chrome greens of commerce (also known as Brunswick green, &c.) are compound greens, formed generally of chrome yellow and Prussian or other blues. These are all lacking in one important property—permanency, to suit them for the purposes

of fine art; though well enough adapted for the mechanic or useful arts. But the true chrome green is the pure oxide of chromium, which does not give nor receive injury by mixture with any other pigment and is also perfectly durable under every circumstance of sunlight, impure air, or sulphuretted hydrogen. It may be prepared of various degrees of opacity or transparency, so as to fit it for a body or a glazing colour, and it may also be varied a little in its hue, so as to make it more or less warm or cool; in colour it may rather be considered fine than brilliant, affording quiet and natural tints, and may be used with equal facility in oil or water, in the former of which it dries well. The depth and transparency of some of its varieties make it invaluable to the landscape painter, and must give it the preference over many other pigments in use, particularly for oil painting; and it also affords a valuable enamel colour. It is to the oxide of chromium that the emerald owes its fine green colour. This pigment is distinguished from almost every other green, in not being soluble in acids or alkalies at ordinary temperature, and they therefore form tests for its genuineness.

COBALT GREEN.

(Oxides of Cobalt and Zinc.)

This is a green which has been but little used, though its merits would entitle it to as high a rank as almost any in use except that last named, to which, indeed, it bears some resemblance, though not quite so powerful in colour. It works well either in water or oil, and in the latter dries readily. Its habits are nearly the same as those of the true cobalt blues. This pigment is easily tested by throwing a small quantity of it in some muriatic or sulphuric acid; if genuine, the green colour is immediately destroyed and the solution assumes a slightly pinkish tint.

COPPER GREEN.

This is the name of a class rather than of a single pigment, comprehending *verdigris, verditer, malachite green, mineral green, Scheeles' green, Vienna green, Schweinfurt green, Hungary green, emerald green, cinnabar green, Brunswick green, green lake, mountain green, Paris green, Saxon green, marine green,* &c.

All these greens are generally characterized by great brilliancy of colour, which well adapts them for the common purposes of industrial art. When used alone, and exposed to light or pure air, they last for a considerable time; but under the opposite influences of damp and impure air, as well as by time, they blacken; they also injure many other colours if combined with them. Upon the whole, therefore, their employment in the fine arts had better be dispensed with. We will, however, particularize the principal ones, more to caution the artist against them than to encourage their use.

VERDIGRIS.

(Sub-Acetite of Copper.)

The distilled or crystalized verdigris, is the kind which has been used for fine art, and is probably the least permanent of the copper greens; as a water colour it fades in sunlight as well as in pure or impure air, but employed alone in varnish it will stand pretty well in pure air or light, while in damp or impure it changes rapidly; it has an

injurious effect upon many other pigments: it would, therefore, be best to avoid it entirely.

GREEN VERDITER.

This was formerly considerably used; but its bad qualities, common to all the copper greens, have nearly discarded it from use. *Green bice* is another name for the same pigment.

EMERALD GREEN.

This is one of the most vivid and opaque copper greens, and as durable as any of its class. Its want of modesty unfits it for representing many objects in nature; but it is very well suited for painting certain kinds of gems and brilliant high-toned greens. In water it works with facility, but with difficulty in oil, in which it also dries badly. Its general properties have already been adverted to.

The name of this pigment is a misnomer, as the true green of the emerald is the oxide of chromium, which bears very little resemblance to this in colour, or any other respect.

MINERAL GREEN.

This is another of the numerous family of copper greens, and is sometimes known by the name of *green lake.* It varies in hue, and possesses the general properties of the other pigments having the same base. Its liability to change when combined with other pigments or exposed to impure air, or by time, makes it ineligible for works of fine art.

MOUNTAIN GREEN

(Carbonate of Copper)

Is a native green found in copper mines, often in thin strata associated with mountain blue; it does not differ essentially from any other copper green. *Hungary green* is a similar pigment.

SCHEELES' GREEN.

(Oxides of Copper and Arsenic.)

The name of this is derived from the discoverer of it, a distinguished chemist. It is a very beautiful light and warm green, quite opaque, permanent

when used alone or in tint with white lead; but, cannot safely be employed with many other pigments, though it is less affected by damp and sulphuretted hydrogen than the more simple copper greens, nevertheless, it cannot be considered an eligible colour. *Schweinfurt green* and *Vienna green* are pigments of the same kind.

PRUSSIAN GREEN.

The pigments known under this appellation are various: one being an imperfectly formed Prussian blue, in which there is an excess of yellow oxide of iron, or to which some vegetable yellow colouring matter has been added, the former of these is about equal, and the latter inferior to the compound green made with Prussian blue and yellow ochre; but a better kind of Prussian green can be prepared by precipitating the prussiate of potash with nitrate of cobalt—this is seldom employed or sold in the shops, perhaps for the reason that it is more expensive than some others.

SAP GREEN

Is the inspissated juice of various green leaves or plants, and is of a fine green colour, but a very bad pigment; it possesses no durability as a water colour, and cannot be worked in oil.

In addition to the before-mentioned, there are several compound greens, such as *Hookers' green* and *olive green*, prepared for water colours, which do not deserve any especial notice here.

Purple.

This, the third and last of the secondary colours, is composed of *red* and *blue*. It forms when mixed with the secondary, green, the tertiary colour *olive;* and with the other secondary, orange, it forms the tertiary colour *russet.*

Purple pigments have the disadvantage of apparent want of durability and beauty of colour, arising

from the neutralizing power of the yellowness of the grounds on which they are laid, as well as to the warm colour of light and the tendency to yellow of most vehicles and varnishes, thus injuring the purity of their colour.

MIXED PURPLES.

In composing these colours, of course any blue and red pigments may be employed which are not chemically opposed to each other and will produce the required hues, or they may be combined either by grinding them together, as well as by the various modes adopted for producing other secondary colours; of course, the more perfect the original colours are, the better will be the purple formed by them. Ultramarine and rose madder lake will form a beautiful purple, which is permanent in every mode of use and under every influence to which colours are subjected in painting. Cobalt blue may also be used in place of ultramarine, but the colour will not be quite as transparent as the former. Less transparent reds may likewise be employed when opacity is not objectionable.

Enough has already been said of the fugitive carmine, lakes, and blues, to need no further caution against their use in compounding purples.

GOLD PURPLE

(Oxide of Gold and Tin.)

This pigment has long been known as *Cassius' purple* and was formerly employed in miniature painting, but since the introduction of madder purple, its place has been well supplied by that, and is now almost exclusively used in enamel painting. It is not a bright, but a powerful and rich colour, varying somewhat in transparency, and in hue, from a deep crimson to a dark purple.

PURPLE MADDER LAKE.

Like all the madder lakes, this varies in depth according to the quantity of colouring matter of madder precipitated with its base, from a light and bright to a most intense purple; and, as already stated, by reason of its superiority it has taken the place of the purple last named, and also of burnt

carmine, formerly so much used, particularly in water colours. It is transparent enough to be used as a glazing colour, and may be employed in oil or water with equal facility of working, drying as well as any of the lakes in the former, and perfectly permanent alone or in tints, injuring no other and not being injured itself by mixing with any other pigment. It may, therefore, be considered as indispensable as any of the madder colours.

BURNT CARMINE.

As the name implies, this is the ordinary carmine of cochineal slightly charred; which since the introduction of the madder colours has gradually grown into disuse; as, like carmine, it is very fugitive, and, therefore, not an eligible pigment for the artist. A colour somewhat similar and perfectly durable, may be prepared by burning madder carmine over a lamp or gentle fire, in a spoon or an iron vessel, stirring it during the operation to equalize the heat, until the desired colour is produced.

PURPLE OCHRE.

The general properties of this are very much like *Indian red*, which it resembles, except in being darker, and more of a murrey colour. Some of the natural ochres, when exposed to a pretty strong heat for a considerable time, produce similar colours, and it may also be made artificially.

MARS PURPLE

Is an artificial ochre of very nearly the same constitution as that last named, but more powerful and transparent, and therefore preferable for many purposes. It may be used in combination with other pigments, like the natural ochres, as it possesses the general properties of them, though more chemically active on such pigments as are affected by iron.

Citrine.

This is the first of the tertiary colours, being composed of the primaries, *yellow*, *red*, and *blue*—yellow predominating, and blue being the extreme subordinate. By some it is very improperly called brown—a kind of generic term applied to nearly all broken colours.

Original pigments of this class are not numerous, unless we include several imperfect yellows among them, which cannot be properly called citrines. The following are considered the best entitled to the name :—

CITRINE LAKE.

The lake to which the above title has been given, is of comparatively late introduction into the artistic world, although it has been used for many years by the person* to whom the author is indebted for the

* Mr. Thompson, of Massachusetts, a gentleman who has spent nearly a lifetime in chemical researches, and the preparation and investigation of the properties of pigments, and whose madder lakes are equal to the best produced in Europe.

first specimen. It is produced from the bark of a well-known tree—the *juglans porcina*, which is indigenous to this country. In colour it is very similar to the fugitive brown pink, but is more powerful and deep; and, unlike that, is perfectly durable, whether employed alone or with other pigments; having been submitted for years to the severest tests, such as the gases, light, shade, damp, &c., the reputation given of it may be depended upon. It works with perfect freedom in every kind of vehicle, and its transparency adapts it admirably for glazing; and it is far preferable in oil to asphaltum, as it does not darken nor lose its brilliancy by time.

BROWN PINK.

Is a lake made from French berries, dying-woods, or the residuum of dying materials, and is a fine transparent colour, tending to a brown, but is more properly a citrine. It possesses great depth, and works well both in water and oil; but, like the lakes generally, dries badly in the latter. It is very fugitive either alone or with other pigments, and for this reason, it has been nearly discarded from use.

BROWN QUERCITRON LAKE.

This is sometimes also called brown pink, and as might be inferred from the name, is prepared from the quercitron bark, already noticed on page 44; it works about the same and is rather more durable, than the last, but, nevertheless, does not deserve a place among permanent pigments.

HAZEL BROWN.

This is a lake of modern introduction—made from the burr of the well-known hazel-nut. In colour it is similar to brown pink, and works with as much freedom, both in oil and water, and possesses one very decided advantage over it—that of being more permanent.

UMBER.

Very few pigments have been longer and more generally used than this, of which there is some considerable variety, that which is known as Turkey umber has been most extensively employed, and is a kind of natural ochre, combined with oxide of

manganese; the latter giving it the strong drying quality which it possesses. It has all the valuable qualities of the ochres, and may be safely mixed with every good pigment in use; it has, however, a slight tendency to become darker by time. In its working, it is equally well adapted for oil or water, and may be used in fresco painting.

Russet.

This, the middle tertiary colour, like citrine, is formed by the three primaries—*red*, *yellow*, and *blue;* red being the predominating colour. Russet is the most important of the tertiaries, and many of the pigments known under the names of reds, purples, &c., more properly belong under this head; yet there are comparatively few true russets, and the following list will comprehend them.

RUSSET MADDER LAKE.

The name of this pigment will indicate its origin. It is a pure, rich, and transparent colour; may be varied in hue from a true russet to a brownish purple, (usually known as madder brown, and intense madder brown,) and, like the other madder colours, is perfectly permanent, under the various influences of light, impure air, damp, or mixture with other pigments; indeed, its utility makes it indispensable in every mode of painting: in water colours, as a local or auxiliary colour, in the glowing autumnal foliage, or with blue, in forming greys for skies, flesh, &c., nothing can equal it. In oil, it may be employed with equal advantage. Its transparency fits it well for glazing; but, like other lakes, it should generally be used with a dryer.

PRUSSIATE OF COPPER.

This is also known under the appellation of *Prussian brown*, differing in composition from Prussian blue, in having copper instead of iron for its base. It is very rich and transparent in colour; but, being

affected by light and other pigments, it is unsafe, and has, wisely, been but little used, and does not require any lengthened notice.

Olive.

This is the last of the tertiary colours and the nearest in its approaches to shade.

Like the other tertiaries, it is also composed of *blue, red,* and *yellow,* the first being the predominating colour.

Olive is usually a compound colour, whether used in the fine or useful arts, and as there are no pigments of this class produced by nature, and but few known in commerce, this list must necessarily be short.

OLIVE GREEN.

The water-colour pigment sold under this name, is a mixed green, which is generally used in landscape drawings, sketching, &c., and though not

entirely permanent, is as eligible as the Prussian green.

BURNT VERDIGRIS.

(Oxide of Copper.)

This is produced by burning the ordinary crystallized verdigris sufficiently to drive off all the acid. It is more durable than verdigris, and dries well in oil; nevertheless, like all pigments made from copper, it undergoes the various changes common to all pigments having the same metal for their base, and seriously injures many others when mixed with them, it will, therefore, be well to avoid it entirely.

Brown.

In the regular descent from *white*, colour properly ceases with the last class. Olive and the neutral black would naturally terminate the series; but in another view, every coloured pigment combines with black, as it exists in them, not only deepening and

lowering them in tone, but also defiling or changing them in class; hence a new series of colours arise, having black for their basis, which are divided into three classes, and distinguished as *brown*, *marrone*, and *grey*. Inferior as they are in colour, they comprehend a great proportion of the most permanent pigments, and may be regarded as being to black what tints are to white, or in other words, may be called black tints or shades.

Brown is frequently understood to include every dark broken colour, but more generally it is applied to a very extensive class of pigments of a warm or tawny hue—such as dun, hazel, or auburn—yellow usually predominating and forming a medium between positive colours and neutrals.

For the reasons already stated, the list of pigments in this class is a pretty long one, and most of them will be found among the following:—

VANDYKE BROWN.

This pigment is as well known as the distinguished painter whose name it bears, and is a kind of bog-earth or peat, of a rich, deep, and semi-trans-

parent brown, which may be used with equal advantage in both water and oil; but owing to its bituminous nature, it dries slowly in the latter. Its permanency is equal to the ochres, and it may be used safely in mixture with every other durable pigment.

MANGANESE BROWN

(Oxide of Manganese)

Is a deep brown of considerable body, which, in oil, dries admirably—like umber; it will be found of considerable service in lowering the tone of white, without tinging it. It is permanent, and may be worked freely in every mode of painting.

CAPPAGH BROWN.

A native brown bog-earth, deriving its name from the place in Ireland whence it is brought, and of much the same nature as umber, though rather more transparent, working well in water, but in oil is a little disposed to run. There is a considerable variety in the specimens, some being light and opaque, while others are quite transparent and suitable for glazing,

not unlike Vandyke brown, and may be employed in every mode of painting in the same way as the preceding pigment.

BURNT UMBER.

This, as may be inferred, is produced by burning the well-known raw umber, which deepens and changes it to a more russet hue; owing to the manganese combined with it, it forms a powerful dryer for oil. It possesses considerable body, works well, and is durable in every kind of vehicle, but has a slight tendency to darken by time.

CASSEL EARTH

Is a native pigment more transparent than the last, but rather less so than Vandyke brown, forming a medium between the two, and equal to either of them in facility of working as well as durability. whether in oil or water colours.

COLOGNE EARTH.

The general properties of this are very similar to the last, though it is darker and more neutral in colour; being bituminous it should be used with some desiccative agent when employed in oil, the same as Vandyke brown.

RUBENS' BROWN

Is a native ochrous earth, in colour intermediate between burnt Sienna and Vandyke brown, and a very permanent and useful pigment, working well in either water or oil, and sufficiently transparent for glazing. It is supposed to be the brown so much used by the old Flemish painters—particularly by Rubens—hence its name.

BROWN OCHRE.

This only differs in colour from the other ochres, and may be employed like them; it exists in abundance in nature, and can be imitated by art.

BONE BROWN.

As may be inferred from the name, this is made from bone, by partially charring it, and is of various shades of light and dark according to the degree of heat employed in making it. It is much used by some artists, but is not perfectly permanent, the lighter sorts being affected by strong light in time become greyish, the darkest specimens are the most durable, and they are all best adapted for oil, as glazing colours, but should be used with strong dryers. In water they are not entirely ineligible, though bistre or sepia are better substitutes for them.

ASPHALTUM.

This is also known as *bitumen* and is found native in various parts of the world, and a very similar substance is produced in the residuum of the distillation of essential oils, as well as in the production of gas from coal. It is a rich, glossy, and transparent brown, and its beauty has often tempted a too free use of it; as time tends to darken it, care should be taken not to use it in excess. It is generally

employed in oil as a glazing colour, and for this purpose is usually torrefied in spirits turpentine and then strong drying oil, and sometimes a little wax or balsam of copaiva is added to it, by which it acquires more firmness or crispness in working, and is prevented from cracking, as it is liable to, when used with spirits turpentine alone. It may also be formed into a liquid brown for water colours, and in this way is preferred by some to sepia or bistre. In every mode of painting it may be depended upon for permanency.

MUMMY,

As implied by the name, is the animal remains from the catacombs of Egypt, combined with the resinous or bituminous substances in which the bodies were embalmed, the action of time having formed, by a slow chemical change, a substance more solid, and not quite so transparent, nor so brown as asphaltum. Its uses and properties are somewhat the same as the latter, but it is less liable to crack, and is better adapted for flesh painting, as with ultramarine it forms some very beautiful and tender greys and tints for shadows.

BISTRE.

This rich and transparent citrine brown pigment is extracted from a watery infusion of the soot of wood-fires, which gives it a peculiar smoky smell. Long antecedent to the introduction of Indian ink, it was employed for shading and tinting drawings, and still maintains its place as one of the most useful and durable water colours. In oil it does not work well, and dries with great difficulty. Its place is, therefore, better supplied by other pigments.

SEPIA.

The sepia, or cuttle fish, affords this dusky brown pigment, which was used by the ancients as an ink, and is supposed by some to enter into the composition of the Indian ink. It is exclusively employed in water, with which it works and washes freely, combining cordially with other pigments, and is quite permanent. In oil it neither dries nor works well.

HYPOCASTANUM LAKE.

This beautiful and transparent brown lake is made from the burr of the horse-chestnut. It is warmer than brown pink; but, unlike the latter, is perfectly durable, both alone or with other pigments, and works well in oil or water colours; in the former, drying as well as lakes usually do.

BROWN MADDER LAKE.

The only difference between this and the russet madder lake already described, is in the colour—which see.

BROWN OF PRUSSIAN BLUE.

The pigment to which this name has been given, is made either by lixivating the ordinary Prussian blue with a strong alkali, or by calcining it, so as to drive off the prussic acid. It varies in colour (according to the quality of blue employed) about as much as Sienna earth, which it resembles in appearance, uses, and properties.

BROWN INK.

Many of the old artists employed brown inks for sketching—the same, it is supposed, as are now used for similar purposes—generally solutions of bistre and sepia; and outlines made with them are not easily disturbed by subsequent washings over them. It is scarcely necessary to say that they are perfectly durable.

Marrone.

For the purpose of carrying out the system already adopted, we continue under this head, the second of the semi-neutrals, composed of *black* and *red*, the latter predominating, being a medium between the warm semi-neutral, *brown*, and cold semi-neutral, *grey*.

DARK INDIAN RED.

This differs in no respect except colour, from the ordinary Indian red—which see.

MARRONE MADDER LAKE.

The name usually given to this pigment is *intense madder purple*, by which title it will be recognized in the catalogues of artists' colourmen. It is a lake of very great transparency and depth, and possesses all the good qualities and permanency of the best madder colours.

Grey.

This is the third and last of the *semi-neutral* colours, the nearest in relation to black, and denotes a faint ashen colour, varying slightly, and including what are termed blue, olive, green, and purple-greys; and the intermediate hues, in all of which *blue* predominates. In this respect differing from the *neutral grey*, formed by the mixture of black and white.

The pigments of this class are few in number, as will be seen by the list which follows; but others may be compounded readily, as required in painting.

NEUTRAL TINT.

Several mixed water-colour pigments are prepared and sold in England, under the various titles of Payne's grey, neutral tint, &c., which are compounded generally of sepia and indigo, or other blues, to which the lakes are sometimes added. Like the tints known as Harding's and Macpherson's, these are all found very useful and convenient; but the artist generally prefers forming tints to suit his own taste, or adapted to his peculiar mode of working; though, to the amateur, who is presumed not to have as much experience in the compounding of colours, they may be of service and facilitate his progress.

ULTRAMARINE ASHES.

This is an inferior grade of ultramarine, being the recrement of the lapis lazuli, from which the finer sorts of that beautiful pigment have been extracted; it varies in colour from a pale blue to a dull grey; and, although not equal in strength or beauty to the better qualities of ultramarine, it is nevertheless extremely useful, and forms more beautiful and tender

grey tones than any compound pigment; for the pearly tints of flesh, greys of skies, the shadows of draperies, &c., it is especially valuable. Its general character, as it respects permanency and working, is the same as the ultramarine of finer grades.

PLUMBAGO.

Although this has been long and well-known as forming the black-lead pencils, in universal use, it has been but little employed as a pigment, notwithstanding it forms some of the purest and most permanent greys, and may be used with perfect safety in every mode of painting and in combination with all known pigments.

Black.

This being the opposite extreme from white, it is considered the lowest in the scale, descending from colours. In its perfect state it should be entirely

neutral, as it respects colour; and transparent, or destitute of reflective power, relative to light, being the representative of shade or depth in painting, as white is of light; there are no black pigments answering to this description perfectly, those, therefore, in use degrade all colours which they deepen, and in some measure neutralize all warm colours, but cold colours they injure only very slightly.

Black being regarded as a compound of the three primitive colours, it may be formed by the direct admixture of them, but nearly all the black pigments in use are either animal or vegetable charcoal; there are, however, a few natural blacks, but they are generally opaque. Pigments of this class are quite numerous, and the principal ones are as follows: without going into detail, we would remark that they are all permanent.

IVORY BLACK.

The pigments usually sold under this name are occasionally made from ivory, but are more generally produced from bones, by burning them to a perfect charcoal, and afterwards washing the

product; the quality varying according to the skill of the preparer. When well made it is a perfect black, durable under every circumstance, and working equally well in water or oil, but in the latter drying badly, a quality common to charcoal blacks and generally of all dark pigments. When too much burned it becomes cindery and opaque, consequently, such specimens should be avoided in painting.

LAMP BLACK.

A well-known carbonaceous black, very fine in texture, of great intensity, and equal in durability to the last, but quite opaque. It may be used with size or gum, like Indian ink, and works very well in oil, but it must be remembered that it dries very badly.

FRANKFORT BLACK.

The lees of wine, from which the tartar has been previously removed by washing, furnishes this pigment, on burning in the manner of ivory black, and it is said that the tendrils and twigs of the vine are also used for a similar purpose. Its name denotes

the place where it is principally produced; other and inferior blacks are also known under the same title. It is more extensively used for copper and steel plate printing than for any other purpose, but it is very useful in painting, being more intense than ivory black, and strong light appears to deepen rather than to fade it; the pure greys seen in some of the works of the old Flemish painters, are attributed to the use of this, or some other pigment of a similar kind that prevented the discolourment of the vehicle. It may be considered one of the very best pigments of its class.

BLUE BLACK.

Another charcoal black made from hard close-grained wood, which may be classed among the inferior qualities of the black last named; it is cooler and more neutral in colour, and when mixed with white has the effect of preserving its purity like Frankfort black.

Another and superior blue black may be prepared, by calcining Prussian blue with the air excluded, in the manner of ivory black; and this,

unlike the charcoal blacks, possesses the property of drying well in oil, and may be employed in the various modes of painting with nearly as much safety as the ochres.

CORK BLACK.

This is also known under the name of *Spanish black* and is a species of charcoal made from cork, differing from Frankfort black in being lighter, softer in texture, less intense, and more blue in hue.

MINERAL BLACK.

This is a native carbonaceous pigment, soft in texture, more opaque, and greyer than ivory black, but blacker than plumbago, and without its metallic lustre, forming pure neutral tints. Its combined advantages of perfect durability, drying well in oil, (a quality not common in blacks,) and opacity, adapts it well for dead colouring as a preparation for black or deep colours, for glazing upon. It may also be used advantageously in water-colour or fresco painting.

MANGANESE BLACK.

(Per-oxide of Manganese.)

Large quantities of this article are used in manufacturing glass, to correct the green colour produced by oxide of iron, and is familiarly known as glass-makers' soap. As a pigment, it answers to the same character as the preceding, possessing great body and powerful tinging properties; like umber, which also contains manganese, it is one of the most powerful dryers for oil in use, and may be well substituted for oxide of lead, as it has no chemical action on other pigments.

BLACK OCHRE

Is a species of mineral black composed of oxide of iron and alluvial clay, and like most other ochres should be thoroughly washed before it is used; but as better blacks can be easily procured, it is seldom employed except for the common purposes of the useful arts.

BLACK CHALK.

This is an indurated clay of the texture of chalk, very much like the last preceding. It is seldom used for a pigment, its principal use being for cutting into crayons for sketching or drawing. It is found in various parts of the world, but the Italian has become the most celebrated, and by some is preferred to the artificial black crayons, though for rough sketching on canvass, where permanency is not desired, charcoal crayons made from soft woods, such as willow, &c., are considered the best, on account of the facility with which the drawings can be erased or brushed off.

INDIAN INK.

A particular description of this well-known water-colour pigment may be deemed unnecessary, as its uses and properties are so well understood. In quality, however, it varies considerably; that which is the purest black, works the most freely, and the finest in texture, is esteemed the best. The exact mode of preparing it is not fully known, but it may

be imitated very successfully by a mixture of fine lamp black and sepia, with a sufficient quantity of size or gum to make it work freely. The genuine has a musky scent. A similar pigment is made in England, and sold under the name of *British ink*.

BLACK LEAD.

Having already spoken of this as a pigment, under the head of plumbago, we now introduce it here under another and better-known title, to speak of some improvements in its application for black-lead pencils. It is pretty generally known that the source from whence the best is brought is at Borrodale, in Cumberland, Eng., and so great has been the demand for it for many years, that the mines have been nearly exhausted, and in a measure closed. To supply the continued calls for it, attention was directed to the invention of some means for purifying the waste which had been accumulating for years, and thrown aside as worthless, and resulted in the discovery of a process by which this refuse has been freed from the impure and earthy particles combined with it, and compressed into a compact form, which

is thought to be equal to the natural lead. For the discovery of the means of accomplishing this desideratum, the world of art is indebted to the perseverance and talents of Mr. Brockedon, of London, who has secured the benefits of his invention by patent.

Tables of Pigments.

As the student, and not unfrequently the professional artist, labours under great disadvantages in the selection of pigments, by reason of the want of a requisite knowledge of their properties and permanency; to supply this deficiency, the following tables have been arranged, and it is thought they will be found exceedingly useful and convenient to refer to. Those in italics are transparent—or sufficiently so to be used as glazing colours; many others may be used for the same purposes under some circumstances, but are equally as well adapted for body colours.

TABLE I.

The pigments named below may be relied upon as being but little, or not at all, liable to change when exposed to light, oxygen, or pure air, and the contrary influences of shade, sulphuretted hydrogen, damp, or impure air, nor by the action of lead or iron, or any pigment having those metals for their base :—

WHITE.

Zinc White.
Constant White.

YELLOW.

Yellow Ochre.
Oxford Ochre.
Roman Ochre.
Sienna Earth.
Stone Ochre.
Brown Ochre.
Lemon Yellow.
Strontian Yellow.
Cadmium Yellow.
Platina Yellow.
Mars Yellow.
Zinc Yellow.

RED.

Vermilion.	Light Red.
Madder Lake.	Venetian Red.
Madder Carmine.	Indian Red.
Red Ochre.	*Mars Red.*

BLUE.

Ultramarine.	*Permanent Blue.*
Blue Ochre.	*Factitious Ultramarine.*

ORANGE.

Orange Vermilion.	*Burnt Sienna.*
Orange Ochre.	Burnt Roman Ochre.
Mars Orange.	*Orange Madder.*

GREEN.

Oxide of Chromium.*	Terra Vert.
Cobalt Green.	

PURPLE.

Gold Purple.	Purple Ochre.
Madder Purple.	*Mars Purple.*

---

* That known as No. 2 is semi-transparent.

CITRINE, &c.

Brown Madder Lake.	*Cassel Earth.*
Vandyke Brown.	Cologne Earth.
Rubens' Brown.	*Asphaltum.*
Bistre.	*Mummy.*
Raw Umber.	*Sepia.*
Burnt Umber.	*Hypocastanum Lake.*
Cappagh Brown.	*Hazel Brown.*
Manganese Brown.	*Mars Brown.*
Citrine Lake.	*Marrone Madder Lake.*

GREY.

Plumbago.	*Ultramarine Ashes.*

BLACK.

Ivory Black.	Peach Black.
Lamp Black.	Mineral Black.
Frankfort Black.	Black Chalk.
Cork Black.	Indian Ink.

TABLE II.

The following pigments are pretty extensively used and are not at all, or very little, changed by light, oxygen, and pure air; but are materially injured by the opposite influences of sulphuretted hydrogen, damp, or impure air, (unless protected by varnish.) They are, therefore, less unexceptionable than the preceding:—

WHITE.

White Lead.	Silver White.
Flake White.	Cremnitz White.
Venetian White.	London White.
Roman White.	Nottingham White.

YELLOW.

Chrome Yellow.	Naples Yellow.*

* This pigment, it must be borne in mind, is injured by iron or ferruginous pigments.

RED.

Chrome Red.

BLUE.

Cobalt Blue. *Smalts.*

Royal Blue.

ORANGE.

Orange Chrome.

Remarks. To the above might be added about as many more pigments which would be affected similarly to the above, and in addition, undergo other changes, either alone or by admixture with others. It has, therefore, been thought best to omit nearly all such, and it is believed that a sufficient number can be chosen from this and the preceding list to supply the wants of the most fastidious, and enable the artist to produce any desired effect or colour within the reach of art.

Vehicles and Varnishes.

As pigments are in many cases essentially affected by the materials employed in securing or distributing them on the grounds to which they are applied, it is almost as necessary that the qualities of these should be as well understood as the pigments themselves, they will, therefore,—as intimated in our preface—form a part of our labours.

There having been much useless speculation, and a great deal of time spent in researches after the modes pursued by the old masters, it is not our intention at this time to enter into such fruitless inquiries, but shall adopt the experience of the most thorough scientific and practical men, added to our own, and rest satisfied with that, believing it will be found perfectly reliable authority.

Water Vehicles.

As water appears to be the most natural vehicle for painting and was probably the earliest employed, so it is also the most active and immediate in its effects upon pigments; and, therefore, all important that for this purpose distilled or filtered rain-water, or that which is as pure as the Croton of New York, and Schuylkill of Philadelphia, should only be employed: as impure or hard water will curdle some colours and prevent their washing and working freely and evenly.

Although water is more rapid in its chemical effects upon pigments than oil, nevertheless, after it dries, very little change takes place, so that the water-colour painter is not annoyed by the variation of colour or effect, bad drying, blooming, and cracking, to which the painter in oil is subject, according to his skill in working, or knowledge of the qualities of the pigments employed by him.

MUCILAGES.

A variety of mucilaginous or gummy substances are used for the purpose of imparting the requisite adhesive qualities to pigments, to fix them upon the paper or grounds to which they are applied, as well as to make them bear out to the eye; the quantity of vehicle required for this purpose varies according to the nature of the pigment employed, some possessing sufficient in themselves without the addition of any more, while others require a considerable quantity to give them the proper tenacity; but as colours are usually sold already prepared for use, any minute details on this subject may be considered unnecessary, but the following brief remarks about the qualities of the substances generally used for this purpose will not be found uninteresting:—

GUM ARABIC.

This has been long employed for forming cake water-colours, but on account of its disposition to crack in drying it is not equally well adapted for all colours without some other addition to give it

tenacity, and as it appears to contain some acid, this should be neutralized by a little water of ammonia, which will add to its facility of working. When it is thought necessary to keep gum already dissolved for use, it may be preserved by adding a few drops of alcohol to it.

GUM AMMONIAC.

The substance known under this name being a gum-resin is soluble in spirit as well as water, in the latter forming a milky solution, which dries transparent. It has many qualities which should recommend it for water colours, as it is very tenacious, works off freely, and is well adapted for forming cakes of colour, affording a vehicle possessing some of the advantages of both oil and water, and may serve, when glazed over the more fugitive colours, to render them more permanent.

GUM TRAGACANTH

Is a strong colourless gum not so transparent as either of the preceding, but of considerable use when

colours are not required to bear out with gloss, or when it is desirable to preserve the touch of the pencil by a gelatinous vehicle which will prevent the flowing of the colours; a little borax added to it improves its working.

ISINGLASS

Has also been used as a vehicle for water colours with some success. The mode of preparing it for that purpose is by making a weak solution of it so that when cold it will flow without its gelatinous quality, adding to it with a gentle heat as much gum arabic as it will take up and work freely when cold.

ALBUMEN,

Or white of egg, has been likewise recommended as a water-colour vehicle, but it possesses no advantages over those already named, and is not to be preferred to them.

HONEY.

In forming moist water-colours this has been employed, but has been objected to on account of its disposition to fermentation and mould, though the colours have the advantage of working freely, and for that reason are preferred for sketching from nature.

ANIMAL GALL

Was formerly employed for attaching the colours to the grounds, when they worked greasy; this, however, has been succeeded by borax, which, though sufficiently alkaline to answer this purpose, has no injurious effect upon the colours.

BEES' WAX.

Within the last few years this substance has been used in small quantities as an addition to the mucilage employed in forming water colours into cakes, which gives them more richness and depth, at the same time they work very freely; it must, therefore, be considered an improved mode of preparing water colours.

Mediums.

It is supposed that in the transition from painting in water to oil colours, that mucilaginous or watery vehicles were used alternately with oleaginous ones, and that some means were used to make them unite with each other, which has given rise to the term employed above. A vehicle of this kind has long been in use in India, composed of lac made miscible with water by means of borax, which may be used alone, or it can be added to oil with which it is diffusible and possesses the advantage of not cracking or contracting in drying, as well as perfect permanency. Another mixture of somewhat similar properties, a few years ago, obtained considerable celebrity under the names of Van Eyck's, silica, or glass medium, which were mainly composed of borax, oil, and water, usually made by grinding the glass of borax (vitrified borax) with poppy or nut oil, gradually adding thereto about the same quantity of water; pictures painted with this medium were said to possess more brilliancy and transparency than those executed in the usual way.

The lac vehicle above named may also be mixed with the essential oil of turpentine, with which it dries without skinning, keeping its place, and making the colours stand up with great firmness, bearing out with much force and transparency.

By means of borax also, soft resins and wax may with proper management be mixed with water; these mixtures are opaque, but in drying, after the water evaporates, are transparent.

Oil Vehicles.

Various fixed vegetable oils have been used for painting in oil, but the following comprise the best of them. All these when used with certain pigments require some addition to render them drying, but all such desiccating agents tend to darken them, or dispose them to acquire colour by time. It will, therefore, be best to employ raw oil, when the nature of the pigments employed will admit of it.

LINSEED OIL.

This is the strongest, most tenacious, and best drying of all the expressed vegetable oils used in painting, and these properties are owing to its combined resinous, glutinous, and oleaginous qualities. It retains its transparency while liquid in the severest cold, being in this respect more like a resin than a fixed oil; like the former, also, it becomes by long exposure perfectly hard and solid by combining with the oxygen of the atmosphere. It possesses, however, the disadvantage of becoming, when not exposed to the air, somewhat opaque, and of a yellowish colour, which darkens by time; it is, therefore, desirable to work the colours mixed with it as stiff as possible. Its natural colour is deeper and more yellow than poppy or nut oils, but as the lighter oils acquire nearly the same colour in a few months after they are used, this temporary difference cannot be regarded as an advantage; still if any objection is made to its colour, this is readily obviated by bleaching it, which is easily done, but it results in no permanent advantage, as it regains colour as quickly as the paler oils already mentioned; besides

this, the little discolourment, which even the most delicate colours receive from the unbleached oil, can form no reasonable objection to its use, as many of them, like the whites, require some breaking down or toning, to make them accord with the sober hues of nature, so that upon the whole we are irresistibly brought to the conclusion, as the best authors have before us, that pure linseed oil is the most unobjectionable of all the oils in use. But this may be improved, in its working and drying qualities, by the following process: procure a bottle and fill it about half full of water, add to it half the quantity of oil, and then nearly fill up the remainder of the space with clean sand and coarse salt, in equal quantities, it should then be shaken well several minutes, every day for about a week, which will cause the impurities and mucilage to subside at the bottom. This operation may be repeated several times, by pouring off the clear oil from the top into another vessel, and then, throwing away the sand, salt, &c., returning the oil to the bottle and proceeding as before; and, lastly, washing with pure water alone.

PALE DRYING OIL.

This is usually made by macerating by a gentle heat any desired quantity of oil with about one-eighth of its weight of litharge, shaking or stirring the mixture frequently to aid its solution, after which the scum may be removed from the top, and then allowed to settle. Acetate of lead may be used in the same way in place of litharge, and the escape of the acid from this tends to bleach the oil; the addition of some smalts, or, in the absence of that, some clean coarse sand, will hasten its clearing by subsidence.

Another method of rendering oil desiccative is as follows: to a quart of oil add about two of water, in which has been previously dissolved about two ounces of sulphate of zinc, and boil the whole gently until one-half the water has been evaporated, then set it aside for a week or two until the oil becomes perfectly clear, when it is fit for use; this does not form as powerful a dryer as the following, but is lighter in colour, and possesses the advantage over the first and second methods, of not injuring such pigments as are affected by lead.

STRONG DRYING OIL.

This is made by boiling linseed oil as directed for pale drying oil, adding as much umber or oxide of manganese as litharge,* if the oil is at all rancid or sour, as it often is, a small portion of chalk will assist its clearing; this will be much darker in colour than the other drying oils already mentioned, and, therefore, not so well adapted for light or delicate colours.

POPPY OIL.

This has long been employed in painting under this name as well as that of oil of pinks, (*huile d'œillet,*) but latterly has gone very much out of use, its place having been supplied by linseed oil, which is stronger, more tenacious, and dries better, though paler and rather slower in changing; it, nevertheless, ultimately becomes nearly as dark as that of linseed,

---

* If the litharge be omitted, a more slow drying oil will be formed, which, like that made with sulphate of zinc, will not injure such pigments as are affected by lead.

and, therefore, merits no preference on account of its lighter colour.

NUT OIL.

The kernels of various kinds of nuts, such as the hazel, walnut, almond, &c., furnish the oil known under this title. It generally possesses less of the glutinous property, which gives the strength and drying qualities to linseed oil, and in that respect, more nearly approaches the nature of the fixed animal oils, which never dry thoroughly in the raw state, but the usual desiccating agents have nearly the same effect upon it as on the oils already mentioned, and the same objection applies to it of becoming as dark as linseed oil in time.

ESSENTIAL OIL OF TURPENTINE.

The uses and properties of this essential oil, known by the commercial name of spirits of turpentine, are so well understood, that it is almost superfluous to speak of it. We will, therefore, only add that it is seldom used by the artist, except to thin

his oil, in cleaning his brushes and paint slab, or as a vehicle in forming varnishes.

OIL OF LAVENDER.

This is an essential oil very much of the nature of the preceding, but is a more volatile and powerful solvent, and being more agreeable in smell, it is for that reason preferred. It is sometimes used as a vehicle for enamel painting; though, perhaps, no better for that purpose than many of the other essential oils.

MACGILP.

The use of resinous substances with oil vehicles dates from the earliest history of oil painting, but was not adopted generally by the old artists, which accounts for the preservation of their works. About the end of the last century, the compound known by the above appellation got into vogue in Great Britain, and was puffed off as a great discovery; but, the premature decay of the works on which it was employed has proved its inutility, time having the effect of decomposing or separating the drying oil

and mastic varnish of which it is composed, producing darkness and opacity, and disposing it to crumble off. Sir Joshua Reynolds and other cotemporary artists were much addicted to the use of this nostrum, as the ruinous changes which many of their works have undergone, fully testifies. Another equally objectionable mixture called *gumtion*, composed of raw oil, mastic varnish, and sugar of lead, attained some celebrity in England about the same time.

When it is desirable to have a vehicle similar in its working to macgilp, a superior preparation of this kind is easily made by mixing together about equal parts of copal varnish and strong drying oil, with a gentle heat, adding thereto about an eighth the quantity of bleached bees-wax.

NAPHTHA.

This is of two kinds—one being made from coal and the other from wood, but are similar in their properties; both being more powerful solvents than the essential oils, and are sometimes used for dissolving resins for varnishes, but they are not suited for vehicles in painting.

ALCOHOL.

A particular description of this is deemed unnecessary, as its properties are generally known; its principal use, in the fine arts, is for forming spirit varnishes, in combining oils with resins, and in promoting the drying of oils with pigments. It is also employed, in conjunction with spirits of turpentine, as a mixture for removing the dirt and varnish from pictures; but, for this purpose, it should never be used, except with great caution and by an experienced hand.

Varnishing.

The last operation to complete the intention of the artist is that of varnishing, which causes the colours to bear out with their full force and beauty, giving a finish to his work, securing it from injury, and in a measure protecting it from the influences of the atmosphere.

Experience has proved that the pictures which were painted with the same vehicle entirely through the whole process have stood the best; therefore, upon the same principle, in varnishing some regard must be given to the vehicle or material in which a picture has been painted; and we would here remark, as a caution, that those which have been executed with maegilp or the softer varnishes are very liable to crack when the harder varnishes, such as copal, are put upon them, owing to the unequal contracting and expanding produced by warmth, and other causes.

The following comprise all the varnishes in general use, and adapted for pictures:—

MASTIC VARNISH.

This has been more extensively used than any other varnish, and is easily made by dissolving the mastic resin by a gentle heat in the essential oil of turpentine, in the proportion, by weight, of one part of the former to three of the latter. One advantage of this varnish is, that when perfectly dry it can be rubbed off with the hand, thus the picture to

which it has been applied can be cleaned very easily, after it has become dirty by time, and the varnish be renewed; but it must be remembered that the operation of removing the varnish may carry with it some of the glazing of the picture, so that it must be done very cautiously, and it would always be safer to let a small portion of the old varnish remain than to run the risk of injuring a picture by endeavouring to take it all off.

This with drying oil forms the ordinary *mastic macgilp.*

COPAL VARNISH.

When properly prepared, we consider this the best and most unobjectionable varnish for paintings. Owing to the disposition of copal to contract in drying and its want of tenacity, it has a great tendency to crack, and this cannot be prevented when spirits of turpentine is employed as the principal menstruum for its solution; to supply this deficiency it should always be made with drying oil, adding only turpentine (spirits) enough to make it work freely: the finer kinds of varnishes made for the outside of coach-bodies, is of the kind described and well adapted

for pictures. The want of due attention to the preparation of this varnish, in the respect referred to, has created the prejudice against its use; but when made as directed, it is especially serviceable for the first varnishing, as, not being dissolved by the essential oils, it forms a perfect protection to the picture and its glazing, (which is often removed in the operation of cleaning when mastic varnish is used,) and the softer varnishes may be applied over it afterwards and cleaned off at pleasure.

The ordinary copal varnish made for varnishing furniture, is not adapted for pictures, as too much spirits of turpentine is used in its composition, and generally its dark colour would form another objection to its use.

This varnish is sometimes employed as a vehicle for painting, and when used throughout the work it will stand perfectly well, and the colours bear out with great force, but it does not work with as much freedom as oil, being a little cloggy. It may also be formed into a macgilp, as will be noticed under its appropriate head.

WHITE LAC VARNISH.

The ordinary seed lac or shell lac, when deprived of its colouring matter and dissolved in alcohol produces this varnish, which is quite colourless and dries in a few minutes without being tacky; but, unless it is used in a very warm room, it does not become perfectly clear for several hours. It is one of the most unchangeable varnishes known, and does not bloom, chill, crack, nor become opaque or dull by time, and, unlike most others, it is not necessary to remove it when once applied to a picture, though it may be done by alcohol, but not by essential oils. A slight quantity may be mixed with oil colours, which assists their drying and makes them stand up and work crisp. It will also be found of service where it is necessary to clothe pigments with varnish to prevent chemical action between them. When applied to miniatures on ivory it gives them much of the force of oil pictures, and adds to their durability.

COWDIE VARNISH.

Within a few years, a new resin, which is extracted from the *cowdie-pine* of New Zealand and Australia, has been introduced into commerce, and quite extensively used in forming a varnish under the above title, which appears well adapted for pictures. It is said to be superior to mastic and as easily and safely removed, but until it has been more thoroughly tested by time, we should hesitate in recommending its use in more unqualified terms.

THE END.

Index.